

VE Pump Spring Installation Instructions

There is some disassembly of the VE pump required to complete this modification. Keeping the internals of the VE pump free from dirt/dust/debris is extremely important. This modification can be done with the pump on the truck.

- 1) Mark current pump timing locations on pump and gear cover, then loosen pump and let drop towards the driver's fender.
- 2) Disconnect the throttle linkage at the throttle arm/lever on the pump
- 3) remove the Throttle Position Sensor (TPS), AFC cover and diaphragm/cone from inside.
- 4) Mark/note position of all the screws such as idle, full fuel, high idle etc.
- 5) Remove the idle screw, full fuel screw and high idle screw. This is needed to access the 4 main Allen screws that hold the pump top on. You may get away with leaving one or two of the above screws in.
- 6) The Allen screws on the back (engine side) of the pump top can be hard to reach but you MUST have a good grip on them even if you need to tap/hammer the Allen key down into the Allen heads. You really DON'T want to break one off.
- 7) Remove the 4 Allen screws.

****NOTE****

The Allen screw on the fender/front side of the pump (large 8mm) serves more than one purpose. It holds the throttle shaft in place, the spring(s) underneath such as the "breakover spring" and the head of this Allen screw is where the TPS shaft rides, on the auto transmission equipped trucks. Once the screw is removed look down into the hole... you'll see a tiny slender black stem with a slot in it. This slot position is very important since it is the "index mark" for the throttle lever.

8) The Allen screw noted comes off in the following order; Allen screw, throttle lever arm, breakover spring, washer, (at this point you should see a flat plate with tick marks like a clock on it. Note the position of the slender black stem in relation to the tick marks. In most cases the slot in the stem will align with the second from bottom and second from top tick marks... kind of like 4:00 and 10:00 so to speak.) Try to leave the lower spring, cup, mount in place. If you have to remove the entire assembly, pay attention to how the large spring is anchored on each end, and the relationship of the plastic "cup washers". Once you progress to removing the pump top, you will lose some fuel from inside the pump so have a drip pan below to catch the dribbles.

9) **VERY CAREFULLY** lift the pump top upward about 1 1/2" while looking at the back (firewall end) engine corner inside. You should see a slotted piece of metal with a what looks like a top hat w/tiny spring IN the slot (careful this puppy can jump out on you once you've removed the governor spring attached to it and, an extra pair of hands makes this part easier). On the inside END of the top hat is the one end of the governor spring. Using forceps or tiny needle nose pliers, carefully unhook the spring from the end of the top hat.

10) Turn pump top over and remove the other end of the governor spring from under the pump top. At this point we need to go back to the "guide pin" that pops out inside the AFC housing... you had to push it into it's hole to get the diaphragm out.... what you need to do, before putting the top of the pump back on is wiggle the little lever on the inside of the pump to push the guide pin back out into the diaphragm hole. This helped me get the top of the pump back on without getting "hung up". Do what works for you.

11) Attach one end of the new governor spring to the underside of the pump top, and very carefully attach the other end to the same spot on the top hat. (Don't worry, you can't put the spring in the wrong place, just be slow and careful.) Turn the pump top over and roughly set the shaft with the index slot in it.... that assures the internal lever with the spring is in the right location for proper rotation.

12) Lower the pump top back down in place, shifting it slightly to seat it in place.

13) Check your index marks as you begin the reverse process of assembly. **(Most mistakes are done here so take your time)**

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- 14) Tighten the Allen screws to "just right ft/lbs torque" This is done by "feel".
- 15) Reverse the process of disassembly and tighten as you go.
- 16) Once all the screws, AFC, housing, Throttle Position Sensor (TPS), etc are in place, return pump to timing marks you made on the pump body/gear case and tighten it down. Here you'll have to get as close as possible to original screw positions for your idle, high idle, full fuel etc. When you've gone over everything 3 or 4 times to make sure you've done everything, you're ready to try a start up and idle.

****NOTE** Remove the air inlet tube from the turbo inlet and move to the side. Have an emergency board or whatever to cover the turbo inlet in case of runaway condition. A second set of hands helps here too, while you activate the manual shutdown lever (in case of runaway) your help can cover the front of the turbo to starve the engine of air)**

- 17) Start the truck. It may need several tries due to fuel loss from removing the pump top. It should pretty much start right up. It may stumble and clear up OR, you'll have to re-prime using the lift pump handle or plugging the filler spout with a rag and shooting compressed air in with a nozzle/air hose to force fuel thru to the pump. (If you do it this way, make sure someone is watching the low pressure bleed screw on the side of the block and tighten it when you get a steady stream of fuel from it.) At this point it should be running. Try 'burping' the throttle a few times. Make sure that the engine returns to idle promptly as it did before the spring change. If it lingers at higher RPM and slowly drops down, take that as a sign of being close to runaway condition. Back out the full fuel screw 1/4 ~ 1/2 turn, restart and try again. I also recommend running your high idle screw in a fair bit to make sure you can "work up to" you intended high idle setting and avoid RPM flare. You should be able to reset your low idle, full fuel, etc without too much trouble. Take a test drive at this point and watch your EGT's, idle, etc.

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